**Main Points**

* HIV Mother-to-child transmission report <1%
  + Do HIV testing ***at least once*** during pregnancy
    - If testing not done in pregnancy, test neonate/child ASAP
    - Consider re-testing HIV negative patients in the second or third trimester
      * selected areas
      * risk factors
  + Antiretroviral agents recommended for use in pregnancy
    - relatively safe
* HIV MCT is largely preventable
  + Five antiretroviral agents recommended
  + C-section for VL> 1,000
  + No breast-feeding
  + Diagnosis of HIV during pregnancy
    - Test older children
  + An HIV infected infant is a potential sentinel event representing
    - missed testing and treatment opportunities
* HIV currently infects 34 million people worldwide
  + 23.5 million people in sub-Sahara Africa
    - ~ 60% are women
      * HIV transmission rates to infants in undeveloped countries
        + 14% - 33% (up to 48% in one study)
  + 1.4 million in N. America
    - ~ 27% are women
  + 16.7 million women worldwide
    - majority of these women are of childbearing age (age 15 – 49)
    - <100 HIV infected babies born/year in US
      * Due to ART for MTCT
    - 330,000 HIV infected babies born/year globally
      * 300,000 sub-Sahara Africa
    - The Scope of the Problem
  + 3.4 million children (<15YO) now living with AIDS/HIV primarily by MCT
    - 3.1 million children (<15YO) in sub-Sahara Africa
    - 4500 in US
      * In 1994, it was around 16,000
* In order to prevent HIV transmission to the fetus/neonate/infant from HIV infected mother (MCT), you need to give appropriate treatment
  + identify HIV infected women
    - perform HIV testing
* **Opt-Out HIV Testing**
* Ohio HIV testing laws have changed
  + No special consent form needed for HIV testing
    - BUT…HCWs must provide information about anonymous testing option to patients on whom an HIV test may be performed ***BEFORE DOING THE TEST***
    - IF….. a patient tests HIV +, then HCWs must provide post-test counseling that goes over 5 things
      * Explanation of HIV test results (confirmatory steps)
      * nature of HIV disease
      * list of resources
      * safer sex info
      * Ohio HIV disclosure law info
* **HIV testing**
  + Anonymous – no links to the patient: results are identified by a number only
    - Problem: if patient doesn’t pick up a + test result, you can’t find them!
  + Confidential – a record of the test exists and is in the patient chart
    - Problem: fear of disclosure discourages some patients from this testing method
* If you have a patient with a positive test….
  + Call UTMC Ryan White Clinics!
    - 419 – 383 -3627
    - help with interpreting and delivering the HIV test results
    - Referral of + patients into care
    - Help with HIV related issues

**CDC HIV Testing Recommendations**

* “To promote informed and timely therapeutic decisions, health-care providers should test women for HIV as early as possible during each pregnancy. Women who decline the test early in prenatal care should be encouraged to be tested at a subsequent visit.”

**CDC HIV Testing Recommendations – Second Test**

* “A second HIV test during the third trimester, preferably <36 weeks of gestation, is cost-effective even in areas of low HIV prevalence and may be considered for all pregnant women. A second HIV test during the third trimester is recommended for women who meet one or more of the following criteria
  + 1) “Women who receive health care in jurisdictions with elevated incidence of HIV or AIDS among women aged 15--45 years
  + 2) “Women who receive health care in facilities in which prenatal screening identifies at least one HIV-infected pregnant woman per 1,000 women screened.”
  + 3) “Women who are known to be at high risk for acquiring HIV”
  + 4) “Women who have signs or symptoms consistent with acute HIV infection

**MCT of HIV**

* MCT HIV transmission occurs relatively frequently without treatment
  + no absolute parameters/thresholds for transmission *or* protection
    - Multiple risk factors contribute to a graded response to transmission (eg –
      * viral load
      * maternal health

Timing of HIV Transmission

* Around 30% intrapartum transmission
* Around 70% in utero transmission

CD4 count

* “T-helper cell” - Coordinating cell for immune system function
* initially the CD4 count falls after infection and
* then rebounds to levels slightly below those seen prior to infection
* factors that determine long term outcome
  + host genotype
  + virus genotype
  + viral load 6 - 12 months after infection
* on average, the CD4 count falls by 10 cells/month: normal count>500 cells/mm
* > 500 (28%) often asymptomatic
* 200 - 500 increasing incidence
  + thrush
  + shingles
  + pneumococcal pneumonia
* <200 (14%) risk for opportunistic infections
  + PCP
  + candida esophagitis
  + toxoplasmosis, etc.
  + **Begin PCP prophylaxis. AIDS**
* <50
  + MAI
  + CMV
  + **Begin MAC prophylaxis**

HIV Viral Load

* The amount of virus in blood
  + proviral DNA
  + genomic RNA)
  + measured via PCR or other nucleic acid test
* can be detected down to 20 copies of virus per cc of blood
  + reasonable representation of the amount of virus in lymphoid tissue
* **best predictor of clinical outcome**
* Like a train heading towards a cliff –
  + CD4 tells you where the train is
  + viral load tells you how fast it is traveling

**Strategies to Prevent MCT**

* PACTG 076:
  + Reduction of Maternal-Infant Transmission of HIV Type 1 with Zidovudine Treatment  
    AZT guidelines
  + Randomized, double-blind placebo controlled study
    - 477 HIV + pregnant women (14 to 34 week gestation) with CD4 >200 were enrolled
    - 409 women went to term (415 live births)
* Women received AZT or placebo
  + Ante partum: 100mg po 5x/day
  + Intrapartum: 2mg/kg IV AZT over 1 hour, then 1mg/kg/hr until delivery
  + Postpartum: for the neonate 2mg/kg q6hrs po X 6 weeks beginning 8 - 12 hours after birth : **no breastfeeding**
    - Infants evaluated for HIV infection by peripheral blood mononuclear cell culture at weeks 12, 24, and 78
      * ELISA and Western Blot were also performed at weeks 72 and 78
* Results
  + No differences in demographics or pregnancy outcomes between the placebo and AZT groups
    - Placebo group: 25.5% infected infants at 72 weeks age
    - AZT group: 8.3% infected infants at 72 weeks age
    - **NEARLY 70% REDUCTION IN MCT**
    - AZT during pregnancy = standard of care (“gold standard”)

**Recommended antiretrovirals BEYOND AZT**

* + NRTIs
    - AZT (retrovir/zidovudine)
    - Lamivudine/Epivir
  + NNRTIs
    - Nevirapine/Viramune\*
      * Avoid if CD4 >250
  + Protease inhibitors
    - Lopinavir/ritonavir (Kaletra)
    - Atazanavir/ritonavir
* Combinations of Antiretrovirals are used in pregnant women
  + HAART – highly active antiretroviral therapy
    - Commonly used regimen
      * Combivir + Kaletra
    - Use preferred agents including an NRTI with good placental passage if feasible
      * AZT/3TC preferred
      * FTC/TDV/ABC alternates
* Antiretroviral therapy to avoid
  + 1) Zerit/Videx
  + 2) Sustiva in the first trimester
    - Avoid if pregnancy potential, but don’t switch if they are already on it and suppressed
  + 3) Nevirapine with CD4 >250
  + 4) oral amprenavir solution (dissolved in propylene glycol)
* Infected pregnant women should receive therapy as recommended for non-pregnant adults, taking into account what is known about specific drugs in pregnancy
  + For example, a pregnant HIV/HBV + woman may be treated with Truvada (tenofovir/emtricitabine) plus lopinavir/ritonavir since this treats the Hep B as well

CDC suggests... for the HIV+ Pregnant woman,

* NRTIs that cross the placental should be part of therapy during pregnancy
  + Goal of therapy: undetectable viral load before labor and delivery
    - HAART should be given for MCT regardless of viral load or need for treatment of the mother
    - Resistance testing performed if the viral load is detectable
* For the HIV+ Pregnant woman, the CDC suggests...
  + 4 CDC scenarios for ART use in pregnancy to decrease MTCT
    - preconception
    - infant with no antepartum/intrapartum ART exposure
    - 1. HIV infected woman receiving ART who becomes pregnancy
      * Continue ART if successfully suppressing viremia (<50 copies/cc)
        + If stable on NVP or EFV, can continue

If VL <400 near delivery, do not need IV AZT

* + - * HIV resistance testing if viral load >1,000 and med adjustment
    - 2. HIV infected pregnant woman who is antiretroviral naïve
      * HIV resistance testing prior to start of meds
      * Consider delay of ART til after 1st trimester
      * Initiate ART regimen
        + Use preferred agents including an NRTI with good placental passage if feasible

AZT/3TC/FTC/TDV/ABC

* + - * + Repeat HIV resistance testing if viral load suppression sub-optimal by 2 – 8 weeks and adjust meds
    - 3. HIV infected pregnant woman who is ART experienced but not currently receiving antiretrovirals
      * Begin ART based on resistance testing and treatment history and information about potential medication teratogenicity
        + Use preferred agents including an NRTI with good placental passage if feasible

AZT/3TC/FTC/TDV/ABC

* + - * + Repeat HIV resistance testing if viral load suppression sub-optimal
    - 4 - HIV-infected woman who has received no ART prior to labor
      * 1) Give IV AZT during labor and give AZT to the infant postpartum as per PACTG 076
        + Begin combination ART in infant as close to birth as possible

Functional or sterilizing cure possible?!?!?

**CDC Recommendations**

* The following are included in all scenarios
  + Resistance testing at start of therapy and if failure to suppress viral load
  + Continue oral regimen during labor and delivery
    - add IV AZT if VL >400 near delivery as per PACTG 076
  + Use preferred agents including an NRTI with good placental passage if feasible
    - AZT/3TC/FTC/TDV/ABC

**Delivery strategies (4 scenarios)**

1. HIV infected woman presenting > 36 weeks gestation, no ART, no labs available before delivery
   1. Start ART
   2. Consider C-section at 38 weeks to reduce MCT
      1. If scheduled c-section, give AZT beginning 3 hours before surgery (1 hour loading dose and 2 hours infusion)
2. HIV infected woman who is on ART, but has a viral load >1,000 at 36 weeks
   1. Continue ART
      1. Consider additional ARV to decrease VL
   2. Consider C-section at 38 weeks to reduce MCT
      1. If scheduled c-section, give AZT beginning 3 hours before surgery (1 hour loading dose and 2 hours infusion)
3. HIV infected woman who is on ART, and has an undetectable viral load at 36 weeks
   1. No information on elective C-section reducing the <2% MCT when VL undetectable to an even further level
      1. Vaginal delivery if feasible
   2. PACGT 076 protocol
4. HIV infected woman scheduled for elective C-section who presents with early labor or rupture of membranes
   1. Start IV AZT immediately
   2. Labor progressing rapidly, deliver vaginally
      1. If minimal cervical dilation, can administer loading dose AZT and proceed with C-section
         1. Try to get loading dose of AZT in before the C-section
      2. Can use pitocin to expedite delivery
      3. Avoid scalp electrodes, other invasive monitoring procedures
      4. Post-partum PACTG 076

**Conclusions**

* MCT rates @25% without treatment
  + treating HIV in pregnancy report <1%
* HIV testing should be done at least once during pregnancy
* If testing not done in pregnancy, test neonate/child ASAP
* Consider re-testing HIV negative patients in the second and third trimester in selected areas and with risk factors
* Need to institute appropriate therapy and plan for appropriate mode of delivery
* Antiretroviral agents recommended for use in pregnancy are relatively safe
* Five antiretroviral agents recommended
* C-section for VL> 1,000
* No breast-feeding
* Diagnosis of HIV during pregnancy
  + Test older children
* An HIV infected infant is a potential sentinel event representing missed testing and treatment opportunities